



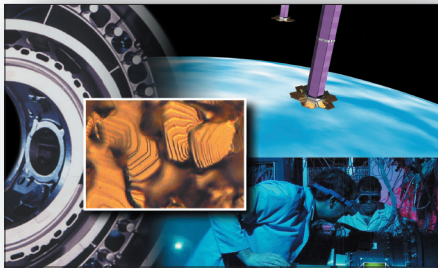
Dual Use Applications Program

Section M

Introduction

Technology Transfer (T²) is the process by which knowledge, capabilities, information, and ideas that are developed under federal R&D funding can fulfill public or private sector, non-military needs. This technology may be in the form of products, techniques, expertise, processes, or services that are developed or modified to meet domestic market demands while they also fulfill a military need.

A recent addition to the method of technology transfer is the Dual Use Applications Program (DUAP). The end of the cold war brought about many changes in the DoD. One of the foremost



was the downsizing of the DoD, including a reduction in R&D and acquisition programs. As a result, the

Defense Conversion, Reinvestment, and Transition Act was passed in 1992, as a means of trying to assist the defense industry in moving toward the commercial arena while still maintaining the defense industrial base. The Defense Conversion Programs of 1992 and 1993 were specific statutory programs aimed at assisting industry to commercialize in areas such as manufacturing.

Along with this specific short-term program came an emphasis on developing dual use technologies in the DoD laboratories. This philosophy means that, where possible, technologies we develop have both a military and commercial application. The extent to which we foster the commercial side of dual use technologies depends on the particular technology and program. The Air Force Dual Use Applications Program is part of a congressionally mandated, tri-service program to cost share projects with industry

for the development of a technology that has both military utility and sufficient commercial potential to support a viable industrial base. An objective of the AF DUAP is to obtain for defense procurements the economies of scale, accelerated product improvements, and increased sustainability inherent in the commercial marketplace. Aspects of this type of technology development program are inherently different in comparison to conventional Air Force technology development efforts. For example, at least 50 percent of the total cost of an individual project must be shared by industry. This approach requires Air Force Scientists & Engineers (S&Es) to recognize the time and effort required by potential industry partner to identify and secure funds needed to cost share on individual projects. Proper planning and early identification of Air Force S&T resources will help ensure high quality proposals are received and successfully negotiated. Outreach to industry is a much more critical element for these types of technology development efforts. Pre-solicitation topic feedback and industry team building prior to proposal solicitation is definitely a change in typical business practices.

The Dual Use Applications Program

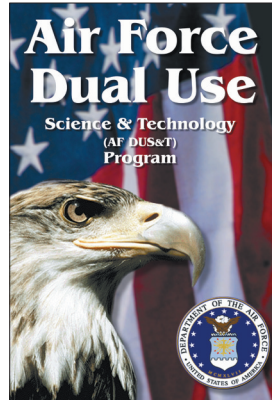
The over arching goal of the Air Force DUAP is to institutionalize procedures and processes required for Air Force S&Es to perform dual use technology development projects on an individual basis and in a businesslike fashion. The dual use funding supplied by Congress is an incentive for Air Force S&T planners and individual S&Es to gain experience and increase the cadre of Air Force personnel who have benefited from working cooperatively with industry. Most importantly, DUAP funding acts as temporary support assisting the services in achieving a Congressional mandate to partner and leverage defense spending to achieve maximum return on investment. The DUAP is divided into two separate programs. The first program is the AF Dual Use S&T (DUS&T) Program and the second is the AF Commercial Operations and Support Savings Initiative (COSSI)

The Dual Use S&T Program

The DUS&T Program, as the name implies, is essentially a program to develop technologies with dual use applications. As such, it is managed by AFRL/XPT. Some dollars are available at the AFRL level to cost share with the AFRL directorates as indicated under the column titled "Available 6.2 Air Force DUS&T Funds" in the below chart. Innovative Assistance Instruments, such as Technology Investment Agreements (TIAs) are often used to structure DUS&T programs in the areas of intellectual property rights, proprietary information, and cost sharing.

The DUS&T Program jointly funds research projects with industry for the development of dual use technologies to solve specific technical problem(s). By increasing the use of these technologies in defense systems, we can take advantage of the same competitive pressures and market-driven efficiencies that have led to accelerated development and savings in the commercial sector. The key is to identify where the Services and firms have mutual interests and can work together to develop technologies that meet both defense and commercial needs. This program is accelerating this process by encouraging the implementation of dual use technology development projects in the Services.

Each of the military services is mandated by the FY 98 Defense Appropriations Act to spend a certain percent of its PE 6.2 budget on DUS&T projects as shown below:



FY	Goal	Amount of 6.2 required to Achieve Goal	Available 6.2 Air Force DUS&T Funds	Total DUS&T Program
98	5%	\$29 M	\$21.8 M	\$25.1 M
99	7%	\$41 M	\$20.0 M	\$31.5 M
00	10%	\$59 M	\$18.6 M	\$44.9 M
01	15%	\$87 M	\$18.6 M	\$40.4 M

As the chart indicates, AFRL will fall short of meeting the Congressionally mandated percentages of PE 6.2 devoted to DUS&T projects. Therefore, it behooves every program manager to consider whether the technology he/she is developing has commercial applications. If there is a perceived dual use payoff, then a dual use program that is cost shared by industry should be considered. Structuring a dual use acquisition strategy at the beginning of the program formulation stage of technology programs is encouraged.

This is the fourth year of the DUS&T Program. In Fiscal Years 1997 and 1998, over 150 projects were approved and over \$130 million of DUS&T funds have been distributed to the Services. These funds, along with the service and industry cost share funds, have resulted in the investment of over \$500 million in development of dual use technologies.

The solicitation process is based on a Broad Agency Announcement (BAA) to solicit proposals from industry and to identify candidate DUS&T projects. The BAA will be the only source of new projects initiated under the DUS&T Program and as such, it is imperative that each service support this joint BAA and meet the milestones leading to project award. A two step BAA provides industry advanced notice of the topic areas and the opportunity to submit white papers to obtain feedback from the government on their proposed response to the solicitation. This advanced notice and feedback allows industry to better prepare their proposals to address the needs of the Services.

Minimum requirements and the selection criteria for DUS&T projects are identified below. Proposals selected by the AF to be funded under the DUS&T Program must meet these minimum requirements and must be selected using these selection criteria.

Minimum Requirements

- The proposal should be for the development of a dual use technology that will meet a military need and have sufficient potential commercial applications to support a viable production base.

- A minimum of one-half of the cost of each proposed project's statement of work (SOW) must be paid by non-federal participants, one of which must be a for-profit company. In addition, a minimum of 50 percent of the non-federal cost share must be in the form of high quality, as defined below. The remaining cost of the project will be shared by the sponsoring Service and the DUS&T Program. The DUS&T Program can contribute no more than 25 percent of the cost of the project. Both the source of industry's cost share and the Service funds, by program element (PE), must be identified during topic generation.
- Industry awards must be based on competitive procedures and based solely on merit.
- Projects must be awarded using non-procurement agreements, i.e., Cooperative Agreements or Other Transactions. These vehicles provide a less burdensome and more creative arrangement between the government and industry and attract commercial companies that do not normally participate in defense procurements.
- The projects must result in the development of a technology, not the application of a technology. Prototypes of the technologies are encouraged. Examples of work not funded under DUS&T include market studies, technology road maps, strategic plans, state of the art surveys, etc.

Selection Criteria

The following criteria will be included in the joint solicitation for proposals and should be used to evaluate and prioritize proposals:

1. Technical and Management Approach--A proposal should score well if it has the following characteristics:
 - Offers a superior, innovative, or unique solution to a military problem, challenge or need;
 - Provides a clear, quantifiable technical objective and a technical approach with a schedule showing definite decision points and end points;
 - Clearly lays out project risks and plans for dealing

with them, including a statement of time-to-market considering available resources and the existing state of the art;

- A project team that includes all the resources needed to successfully develop the technology and turn it into a product or process;
- A project team that is organized for efficient and effective execution of the project. There should be clear, complementary roles for all members and clear lines of responsibilities and authority in the management of tasks and cost control.

2. Military Benefit-Projects should focus on technologies that will have a major impact on the cost, performance or sustainability of defense systems. In general, technologies that will have the greatest impact on the Nation's defense as well as those that will have a pervasive impact across a range of defense systems will be rated higher. In addition, the proposal must include a strategy (specifically, the need and timing for planned system or upgrade) for incorporating the technology into a defense system(s).

3. Commercial Viability of Technology - An objective of the DUS&T Program is to

obtain the economies of scales, accelerated product improvements, and increased sustainability inherent in the commercial marketplace for defense procurements. Thus, it is essential that a commercialization path for the proposed technology be identified and that potential commercial applications be sufficient to support a production base that would be capable of meeting future defense requirements. To be avoided is a technology that would not be economically viable without significant military buy-in.



4. **Quality of Cost Share**-When evaluating the quality of the proposed cost share the primary focus must be on the risk being assumed by the for-profit members of the proposal team. Proposed cost share should be evaluated and identified as “High,” “Low,” or “Unacceptable” according to the three definitions below. The sum of high and low quality cost share must be at least 50 percent of the cost of the project’s SOW, of which at least 50 percent must be high quality. High quality cost share is preferred, and those proposals containing predominately high quality cost share should be ranked higher in this criterion than those containing a large percentage of low quality cost share.

5. **High Quality Cost Share**-These are financial resources that will be expended on the proposed project’s SOW and will be subject to the direction of the project management team. These are funds expended by the non-federal participants for man-hours, materials, new equipment (prorated if appropriate), subcontractor efforts on the project’s SOW, and restocking of parts and material consumed. High quality cost share can include government-reimbursed IR&D funds, but only if those funds are offered by the proposers to be spent on the SOW and subject to the direction of the project management team.

6. **Low Quality Cost Share**-These are non-financial resources that will be expended on the proposed project’s SOW and will be subject to the direction of the project management team. This is typically wear-and-tear on in-place capital assets like machinery or the prorated value of space used for the project.

- **Unacceptable**-This is a resource that either (1) will not be expended on the proposed project’s SOW; or (2) will not be subject to the direction of the management team as discussed above. Unacceptable cost share should be subtracted from the proposers claimed total cost for the project, and the required industry cost share recalculated. A non-exhaustive list of examples include:

- sunk costs, i.e., costs incurred before the start of the proposed project;
- foregone fees or profits;
- bid and proposal costs;
- value claimed for intellectual property or prior research;
- parallel research or investment, i.e., research or other investments that might be related to the proposed project, but which will not be part of the SOW or subject to the direction of the project management team. Typically these activities will be undertaken regardless of whether the proposed project proceeds;
- **Off-Budget Resources** - These are resources that will not be risked by the proposer on the SOW, and should not be considered when evaluating cost share.

Guidelines for Service Cost Share

Service cost share must be funds placed on the funding instrument to industry, expended on the proposed project’s SOW, and subject to the direction of the project management team. These funds can be drawn from outer years, but they must be identified by PE on the project summary sheet and must not be contingent on the success of the initial phase(s) of the project. If a project is selected for DUS&T funding, these Service funds must be committed to the project. As in the case of industry’s cost share, sunk costs or parallel research will not be counted toward the Service’s share of the project cost. Service funds for these projects should be drawn directly from Service appropriations and not from those of defense agencies or other federal organizations.

The Fiscal Year 1998 Defense Authorization Act has established goals for the initiation of dual use projects for each of the military departments. The goals are based on obligations of 6.2 - Applied Research funds and start at 5 percent for Fiscal Year 1998 and climb to 15 percent for Fiscal year 2001. The Fiscal Year 1998 Authorization Act also requires that a report be sent to Congress describing the progress each military department is making in obtaining

these goals. It is imperative to understand that only Service 6.2 - Applied Research funds can be used to meet these goals. While other funding can be used for Service matching funds it is recommended that to the maximum extent possible 6.2 - Applied Research funds be used. In addition, because this is an S&T program the use of other funds besides S&T (6.1 to 6.3) funds should be kept to a minimum.

Out of Scope Proposals

The DUS&T Program will not fund the following types of proposals:

- **Studies**-The primary output of DUS&T funded research should be a new product or process technology, not paper. Types of studies not funded under DUS&T include market studies, technology road maps, strategic plans, state of the art surveys, etc.
- **Capitalization or Facilities**-DUS&T projects should focus on the development of a militarily useful, commercially viable technology, not the capitalization of a factory or the building of a testing facility. DUS&T cannot pay for equipment not needed for projects research.
- **Proxy or Fee-for-Service Organizations**-DUS&T cannot fund the mere establishment or sustainment of organizations with an agenda of problems but no specific solutions. It also cannot fund the establishment of fee-for-service testing or technology transfer organizations.

The Commercial Operations And Support Savings Initiative

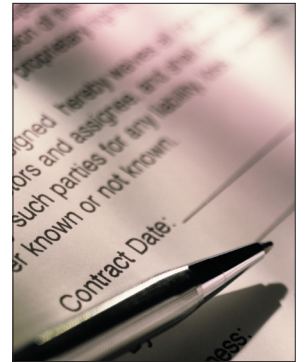
Another dual use program for reducing DoD Operations and Support (O&S) costs by routinely inserting commercial items into fielded military systems is the Commercial Operations and Support Savings Initiative (COSSI). The objective of the COSSI Program is to use a streamlined contracting approach to enable industry to propose commercial components, technologies, and/or processes for insertion into fielded military systems to reduce O&S costs.

O&S costs are all the costs of owning and operating military systems, including the cost of maintenance, spares, software support, personnel, and consumables associated with the peacetime operation of a weapon system. (The costs of developing, purchasing, or disposing of the system are not considered O&S costs.).

COSSI is a two-stage process. Stage I is executed via Other Transaction agreements, which are not constrained by restrictive policies found in typical contracts. Stage I costs are shared by industry and DoD, with DoD costs being funded by the appropriate COSSI program element. Assuming Stage I is successful, the implementing program office will have the option to execute Stage II, which is to procure and install the “modification kits” demonstrated in Stage I. Stage II funding is provided by the implementing program office, and purchases will be funded by the military customer.

During Stage I, the COSSI Program Manager and the selected proposal submitter share the costs of developing and testing the kit. All COSSI projects must have a minimum 2:1 savings to investment ratio and must include the written support of a “military customer” who has the authority to modify the fielded systems, and can procure and install the Stage II kits. Typically, the military customer will also oversee Stage I, which usually lasts 1-2 years.

At the end of Stage I, the military customer will decide whether or not to buy the kits offered. Accordingly, Stage I proposals must include Stage II target prices and quantities for the kits. This target price should be one that the military customer will regard as “fair and reasonable” and should cover everything the military customer needs to purchase to execute Stage II. If the military customer decides to proceed with Stage II, he/she will purchase a reasonable production quantity of kits without recompensation, at the fair and reasonable target price agreed upon, and without requiring proposers to provide detailed cost of pricing data.



In FY 97 and FY 98, COSSI was provided through the Defense Advanced Research Projects Agency (DARPA) under PE 63805E, and the program was managed by SAF/AQRE. For FY 99 and beyond, each service gets its own funding in separate PE's; the Air Force PE is 64805F. [Note that the funds are now 6.4; COSSI uses the authority of Sec. 845/804 to negotiate Other Transaction agreements for prototypes instead of the normal FAR contract.] Also, in November 1998, responsibility for managing the Air Force COSSI program was delegated to ASC/SMA.

The budgets for FY 97 and FY 98 went for projects selected in FY 97, while FY 99 funds are for FY99 projects. FY 00 funds are for FY 00 projects, etc. In addition, the contractor's cost share was set as a minimum of 25 percent starting in FY 99.

FY	Total DoD Request	Total DoD Funded	Air Force Request	Air Force Funded
97				\$ 11.5 M
98		~ \$ 100 M		\$ 13.3 M
99	\$ 61 M	\$ 50.9 M	\$ 15.9 M	\$ 10.7 M
00	\$ 98.6 M		\$ 30.5 M	
01			\$ 30.4 M	

The Air Force COSSI program is administered by the Aeronautical Systems Center's Aging Aircraft Support Product Group located at Wright-Patterson AFB, Ohio. It is part of a larger Department of Defense (DoD) effort with participation by the Army, Navy, and Office of the Secretary of Defense (OSD).

Planning And Execution

For the dual use program to be viable, you must plan for and execute the dual use strategy outlined by DoD Directive 5535.3, dated 21 May 1999. Following are suggested steps to ensure the success of the DUAP strategy.



Planning - Planning for dual use must start at an early stage for maximum pay-off. Look in

depth at each technology to be developed and an acquisition strategy that explores all the options at the outset. Leadership must set the tone by advocating a fresh look at the way concepts are institutionalized. For example, the Development Activity Panel (DAP), a DUS&T panel charged with oversight of the DUS&T portfolio, advocates looking at all technology development programs to see if the possibility of dual use concepts can be applied. Leadership must embrace the concepts to ensure adequate thought is given to the structure of the program. All technology areas should be surveyed to see if leveraging opportunities exist. Technology Advisory Boards (TABs), Executive Councils, and Center Technology Councils must embrace the dual use concept and ask the penetrating questions necessary to get an honest appraisal of the candidates. Some considerations are:

- **Affordability** - One of the main goals of dual use programs is the impact these programs have on affordability. There is a great deal of information available to help determine the cost incentives and pay-off from dual use initiatives. Since considerable weight is placed on this item, it makes sense to have models available to estimate cost payoff.
- **Targeting Industry** - After technology assessments, the next logical step may be to seek out industry partners who are interested in cost shared partnerships. To some extent, this will mean thinking outside the box as related to traditional partners since many of the traditional contractors are still military acquisition oriented. At the minimum, it will probably mean getting traditional contractors to work with the commercial venture side of their company to bring in the commercial flavor and structure the agreements appropriately.
- **Creating the Market Pull** - In the long run, companies will only become involved in cost shared partnerships if they can make money or receive some return on investment. Again, there must be out of the box thinking to create programs designed to do this, while at the same time accomplishing the technology development for military

applications. Market assessments (with assistance from expert outside services) must be accomplished, upon which to base program viability. Making the rounds to brief companies on the structure and goals of the programs still needs to be done, much in the sense of traditional industry briefings done on present Request for Proposal (RFP) programs. Again, this is rather foreign to the way business has been done in the past and will take considerable effort to go up the learning curve of viewing the technology development cycle from the angle of commercial business. Finding partners in this arena is much like creating the business plan and going out to hunt venture capital.

- **Programming** - One way to enhance dual use considerations is to select demonstration programs from each division, directorate, or center for execution. This allows a learning curve for the concepts of how to develop technologies in a dual use environment. There is a need to engage the DUAP strategy and then be committed to it. Otherwise, industry will view the organization as an unreliable partner. In the long run, if dual use is institutionalized, competition for funding of some programs will be based on leveraging concepts. Some considerations are:

1. **Creating a Portfolio** - A portfolio of actual technologies identified by looking at the road maps and assessing the technologies needed in the short, mid and long range to support system applications should be conducted. After several cuts, pilot projects can be established in each center division that will specifically be structured as dual use from the beginning with cost share principals invoked. This process would also lead one to think in terms of high value commercial application.

2. **Assessing Partners** - After creating a portfolio of technologies for dual use development, devising the business plans to make partnering pay off, and creating the clientele, the next step is using sound judgment in evaluating proposals in response to the

partnership call. In the selection process, the business aspects of the prospective partner are evaluated. This could be considered due diligence. What is the financial status of the company? What does the Dunn and Bradstreet report say? What is the history of taking new technology the market place? In other words, evaluate the partner prospect much as one business would evaluate another when considering a partnership. Success depends on your partner.

3. **Courting the DARPA** - DARPA has been using Other Transactions and Cooperative Agreements longer than the individual services. There are many lessons learned from doing business in the cost shared arena that they are willing to share. By the same token, it may be possible to establish better relationships with DARPA from the view point of making it known that you are willing and able to be an agent for DARPA in the technology development arena.

4. **Executing** - The basic concept of dual use program execution is that of finding a partner in industry that is willing to invest in the technology because it will pay off from both commercial and military applications. Paradoxically, the military industrial complex that we have traditionally dealt with in military acquisitions is very slow to change its mode of operation and combine both the military and commercial business units. Industry must certainly do this if technology is to be utilized to its fullest economic benefit. There is a full range of instruments to carry out the strategy. Some are listed below:

5. **FAR (Federal Acquisition Regulations) vs. Non-FAR Instruments** - The authority to enter into contracts, Cooperative Agreements, Grants, Other Transactions, and Section 845 Prototype Program has been delegated to the Services. It seems clear that there is the ability to use the full range of appropriate tools for accomplishing the mission from a partnership with industry perspective. Dual use should be recognized as a core business process!

Many of these new instruments require a new way of thinking about intellectual property rights, commercialization, cost sharing, evaluation criteria, and FAR restrictions. By the same token, consortia and commercial enterprises that have not traditionally done business with the government from an R&D sense can be sought out as partners in technology development where it makes sense. The full range of instruments needs to be embraced where they make sense to support dual use technology development.

6. Solicitations - Wider use of BAA and RFI methods for soliciting partners for dual use programs are encouraged. RFI may yield information about companies who are willing to work in partnership mode. Solicitations should clearly define the partnerships, the possible commercial payoff, the evaluation criteria, and the deliverables. Cost shared Phase III SBIRs are also a possibility that have not been fully explored, even though we track and encourage the transfer of SBIR technology for commercial application (as mandated by law).

7. Follow-up - Some follow-up on the commercialization of technology in dual use programs is a necessity. Continuing scrutiny of intellectual property protection is a must. There are various means to do commercial potential studies such as the Federal Laboratory Consortium sponsored program for Phase II SBIRs and the use of royalty funds to assess technologies. Continuing development of the commercialization strategy during a dual use program should be an item of interest at program reviews with additional follow-up and assistance from the government side where possible.

Conclusion

The following actions, although not all inclusive, are recommended to the T² staff as a starting point to carry out a dual use strategy:

- Hold in-house educational seminars on dual use strategy and the funding agreements used to carry out the strategy.

- Analyze your program portfolio for possible dual use implementation / acquisition strategies.
- Embrace dual use as a management philosophy to the staff, TAB, Executive Councils, and Center Technology Councils.
- Solicit partners for dual use technology development through BAA/CBD/RFI.
- Position your organization to leverage dual use dollars when the opportunities from DARPA, AF, and DoD arise.
- Be committed to the business strategy once you enter into a dual use partnership.